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ABSTRACT

Data that were originally gathered during the 1978-1990, 1994, and 1996 Scottish School Leavers Surveys were subjected to a secondary analysis to identify the qualifications, characteristics, and choices of high-attaining female school leavers. The analysis revealed that female and male high-attaining school leavers had broadly similar average qualifications, and most of them went on to further full-time study. However, males generally opted for more stereotypically "male" subjects such as engineering, technology, mathematics, and computing, while females generally chose more people-oriented subjects such as education, languages, and biological sciences. Those subject choices had an important impact on male and female school leavers' later attainment and opportunities. Female high-attainers generally outnumbered male high-attainers; however, the gap narrowed in later years of schooling. The study confirmed the relationship between social advantage and high attainment for students of both genders. The fact that girls appeared to take school more seriously than boys did appeared to be the only factor that could explain differences in males' and females' academic attainment. (Twenty-seven tables/figures are included. The bibliography contains 30 references. Appended is a table detailing responses to survey questions about parents' involvement in the secondary education of their high- and low-achieving male and female children.) (MN)

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ED 443 013

CES CENTRE *for* EDUCATIONAL SOCIOLOGY

SCOTTISH SCHOOL LEAVERS' SURVEY

HIGH ATTAINING FEMALE SCHOOL LEAVERS

Report commissioned by

THE SCOTTISH EXECUTIVE EDUCATION DEPARTMENT

February 2000

Teresa Tinklin

The University *of* Edinburgh

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Chapter 1
Introduction

This report focuses on high attaining female school leavers, examining their qualifications, characteristics and choices. It forms the third of a series of reports, commissioned by the Scottish Executive Education Department (formerly SOEID), based on secondary analyses of data from the Scottish School Leavers' Survey (SSLS). The first two reports in the series focused on:

- Entrants to higher education (Tinklin and Raffe, 1999a and b),
- Gender and low achievement (Biggart, 1999).

A further report is planned on early entrants to the labour market.

The SSLS is a rich source of data on the characteristics, destinations, experiences, attitudes, attainment and social backgrounds of Scotland's young people as they make the transition from school to education, training or work. Surveys have been carried out at least every two years since the late 1970s, making it possible to analyse trends over time. The survey will be described in more detail later in this chapter.

Background

Prior to the passage of the Sex Discrimination Act 1975 girls were less likely than boys to leave school with formal qualifications (Powney, 1996). Almost 25 years later, this situation has reversed. Girls are now more likely to stay on at school beyond the age of 16, and to leave school with better qualifications than boys (SOEID, 1998a). Levels of attainment have increased for both boys and girls since the late 1970s, but the rate of improvement has been faster for girls, resulting in a substantial gap in attainment between males and females in 1997. Almost half of female pupils left school in that year with Highers, compared with about 40% of males (SOEID, 1998a). Where policy-makers, educationists and researchers were previously concerned with the relative disadvantage of girls in education, their focus has now shifted to the 'underachievement' of boys (Powney, 1996).

The fact that females are now attaining more highly than males at school should be treated with some caution, since this conclusion is based on average performance. Some girls are still underachieving, just as some boys are doing well. It has been well-documented, for example, that working class pupils of either sex tend not to do as well at school as their middle class peers (Paterson, 1991) and there is evidence of a positive relationship between ethnicity and attainment (Sammons, 1995).

Undoubtedly a broader range of choices and opportunities is now available to women and this is evidenced by the increasing numbers of women who have entered the workforce over the past 20 years (EOC, 1997). However, gender differences remain. Girls and boys are still inclined to take different subjects at school even within the constraints of the Scottish

Curriculum Framework (Croxford, 1994, 1996). They are also inclined to aspire to gender-stereotyped careers (Furlong and Biggart, 1999) and, on leaving school, to go into gender-specific areas of work and training (EOC, 1997). Women's average income was still only 80% of men's in 1997 (EOC, 1998).

One might expect the experiences of high attaining females to be different from those of other females, their good qualifications providing a ticket to a broader range of choices and opportunities. There has been little research focusing on females' high attainment (Sammons, 1995; Whitehead, 1994) and, in Scotland, little research of any kind specifically addressing the area of gender and education (Powney, 1996). This report goes some way to redressing that balance. It focuses on female high attainers, investigating their qualifications, characteristics and choices. It aims to address the following broad questions, with a separate chapter of the report dedicated to each.

- How do the qualifications of high attaining females compare with those of high attaining males? (Chapter 2)
- Are there gender differences in the subject choices made by high attainers? How do these compare with the subject choices of others? (Chapter 3)
- What factors are related to high attainment and are these different for males and females? (Chapter 4)
- What do high attaining females do after leaving school? How do their chosen destinations compare with those of high attaining males and other females? (Chapter 5)

The final chapter provides a discussion of the overarching issues arising out of the research.

Definition of high attainment

High attainment is defined as the attainment of four or more Higher Grade passes at A-C by the time of leaving school. Three or more Highers is usually seen as the minimum entry requirement for higher education and selecting four or more allowed us to investigate the group of students who achieved more highly than this. In addition, the cut-off point designates approximately one quarter of the most recently-available survey sample as high attainers, providing a sufficient sample size for the analyses undertaken.

The Scottish School Leavers Survey

The findings of this report are based on secondary analysis of data from the Scottish School Leavers Survey (SSLS). The SSLS was conducted every two years between 1976 and 1990 by the CES, in partnership with the Scottish Executive, the Economic and Social Research Council (ESRC, formerly SSRC), and other sponsors. Since 1992 it has been carried out by the National Centre for Social Research (NCSR, formerly SCPR), funded by the SOEID (now SEED) with additional support in 1993 from Strathclyde Regional Council (Lynn, 1995).

Each survey was conducted by post, using a questionnaire of up to 16 pages. Most surveys covered a 10% sample of school leavers from all secondary schools, except special schools,

in Scotland. (The 1978 and 1980 surveys involved larger samples, from which 10% sub-samples have been used in the dataset used here). Response rates to all surveys were generally high: between 70% and 80%, except in 1990 when the response rate was 56%. Each survey was carried out in the spring following the session in which the young people left school. For clarity, years quoted in this report refer to the year of leaving school, and not the year of the survey.

In 1997, the design of the survey was changed and a 10% cohort of young people who were in S4 in 1996 were surveyed rather than a sample of school leavers. This cohort has been followed up this year (1999) and will be followed up again in 2001 at age 20-21.

The most recent SSLS data available to us for this research came from the surveys of 1994 leavers and the cohort of 1996 S4 pupils (referred to as 1996C). Data from the surveys of 1978 – 1990 are also used, from the Trends dataset held at CES. Table 1.1 shows achieved sample sizes for each survey used.

Table 1.1: Unweighted Bases

	1978	1980	1982	1984	1986	1988	1990	1994	1996C
Sample sizes	5948	5550	7047	6400	5751	4928	3586	3223	4302

Data on curriculum and qualifications

The 1994 leavers dataset provided only limited information on Standard Grades and Highers attained and no information on subjects studied, grades or qualifications attempted while at school. With additional support from the SEED, SQA data were linked with this dataset. This provided much more detailed information on qualifications attempted and gained in each school session, on grades of pass and on subjects. This information will also be used in later reports in this series.

Weighting

Each survey used birthdate sampling to construct a representative sample of school leavers. However, it is likely that non-response introduced bias into the achieved samples, since some groups, such as the poorly qualified, were less likely than others to respond to the questionnaire. Non-response bias was therefore corrected using weighting factors based on sex and qualifications.

A note on tables and figures

All tables and figures in this report refer to percentages, except for tables reporting bases, which are labelled as such. Percentages have been rounded to the nearest whole figure; this means that some columns or rows may not sum to 100%. All percentages cited in the report are based on weighted data, while all bases are reported unweighted. Unweighted bases show

the actual sample sizes on which a percentage estimate is based, and thus give a more realistic idea of the reliability of each estimate.

Chapter 2

The qualifications of high attaining females

This chapter focuses on the qualifications of female high attainers at all stages including Standard Grades, Highers, SCOTVEC modules and CSYS. It answers the broad question:

How do the qualifications of high attaining females compare with those of high attaining males?

The following different aspects of attainment are addressed.

- Total numbers of qualifications at different levels,
- Grades (where data are available),
- Patterns of presentation.

Gender differences in subject choice are examined in chapter 3.

Numbers of qualifications and grades

Highers

In 1994, 28% of female pupils left school with four or more Highers passes at grades A-C compared with 24% of males. Figure 2.1 shows that there has been a gradual increase in the proportions of young people leaving school with four or more Highers since the late 1970s, with a more rapid increase since the late 1980s. It also shows that girls did better than boys in most years. But it is only in 1990 and 1994 that the gap is significantly different (at the $p<0.01$ level).

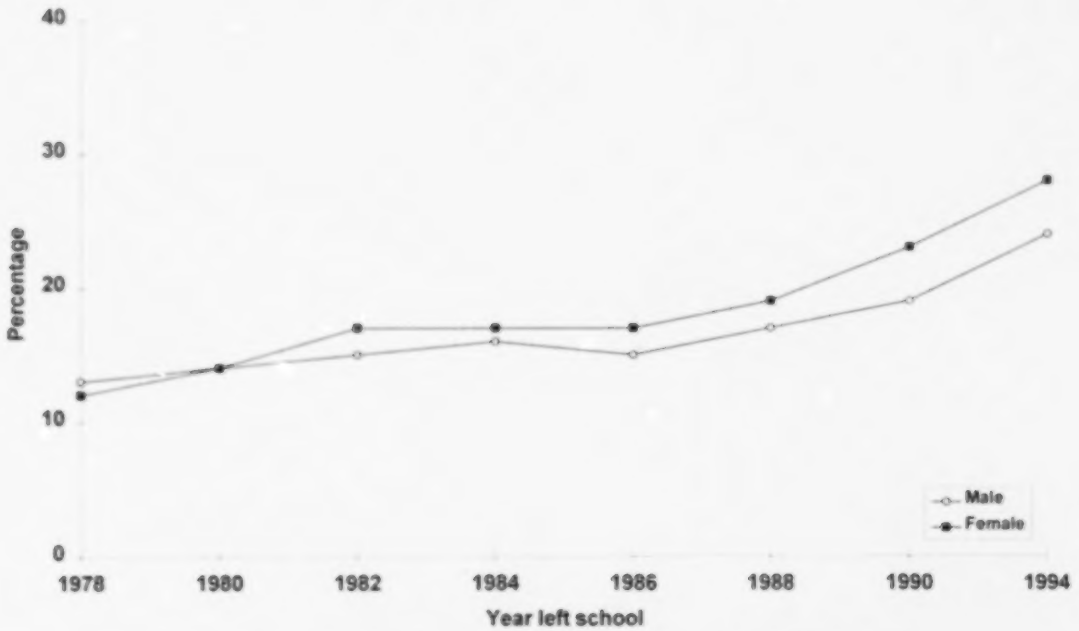
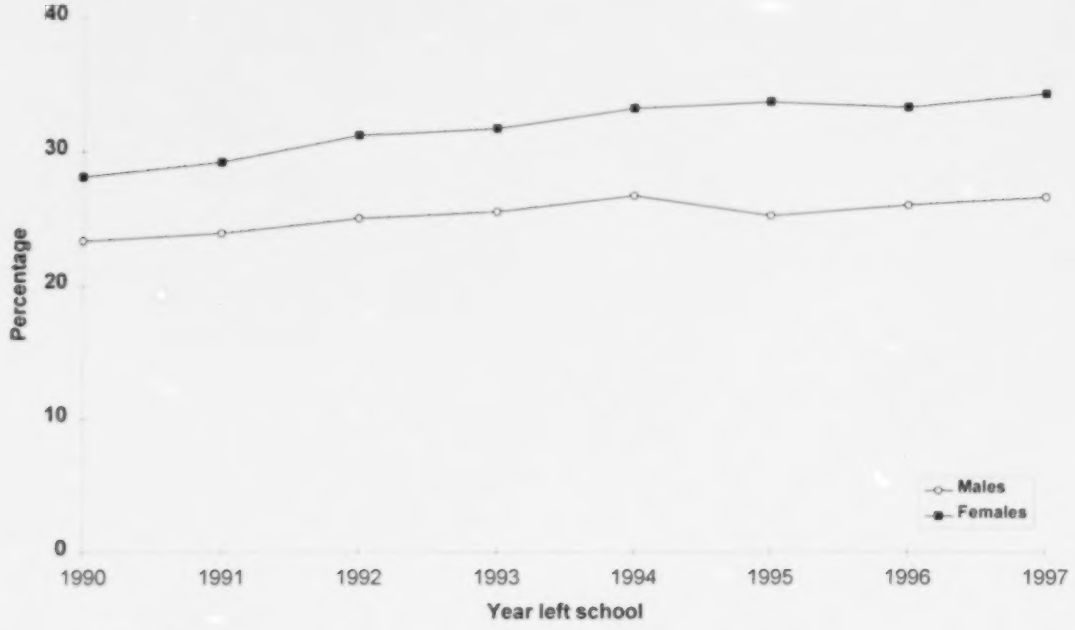


Figure 2.1: Percentage of school leavers with 4+ Highers passes

SOEID (1998a) statistics give some indication of what has happened since 1994, although they are based on the attainment of 3+ Highers rather than four or more. Figure 2.2 shows that the gender gap is much wider for 3+ Highers, and that the increase in attainment flattened off from 1994-97 for both sexes, with the gap remaining fairly stable at an average of 7.5 percentage points from 1994 onwards.



Source: SOEID (1998a)

Figure 2.2: Percentage of school leavers with 3+ Highers passes

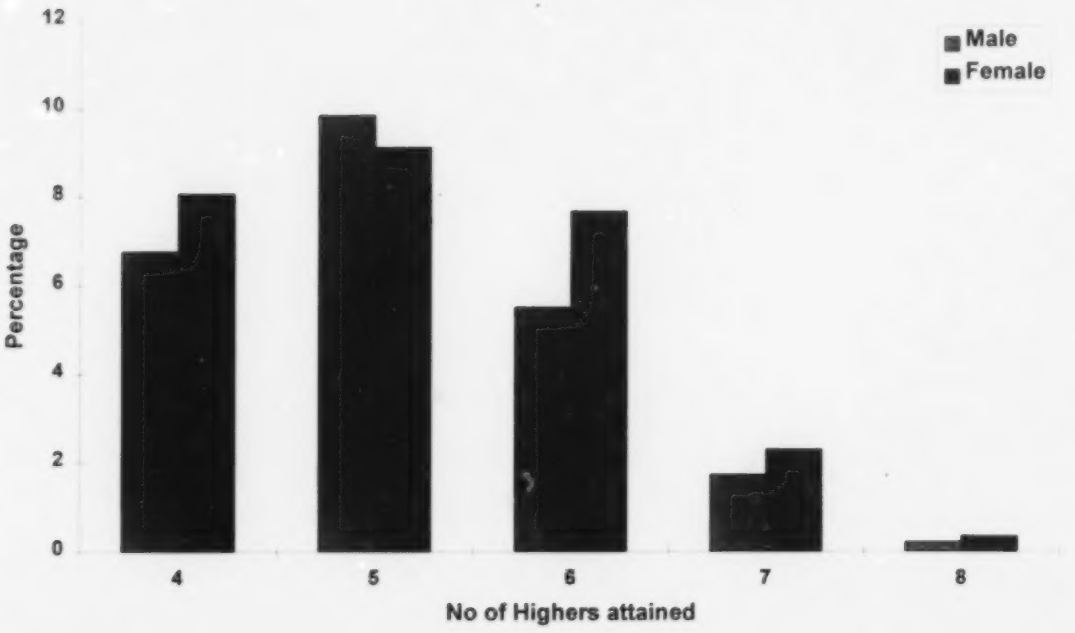


Figure 2.3: Percentage of male and female school leavers with 4+ Highers (1994)

Highers qualifications were very similar. Both female and male high attainers had an average of just over five Highers passes in 1994 and the small gender differences in number of Highers attained shown in Figure 2.3 are not significant. There were no gender differences in average Highers grade (average for both sexes: 1.9, where A=3, B=2, C=1).

SCOTVEC Modules

High attaining females were more likely to have completed one or more SCOTVEC modules (females: 44%, males: 36%), and both males and females with modules tended to average just over two passes.

Certificate of Sixth Year Studies

Female and male high attainers were equally likely to have CSYS passes in 1994 (approximately half had passes), but boys tended to have a higher number of passes on average than girls (boys: 1.75, girls: 1.49). This is explained by the fact that boys tended to gain more passes in mathematics for which there are a number of CSYS papers. More details on subjects taken are to be found in chapter 3. Male and female high attainers with CSYS tended to get the same average grade of slightly better than a C.

Patterns of presentation

Research has suggested that patterns of examination entry vary for boys and girls (Arnot *et al.*, 1999). In particular, there has been some evidence from England and Wales that teachers may be inclined to enter girls for 'safer' options to protect them from anxiety. This section provides a comparison of patterns of presentation by high attaining females and males at Standard Grade, Higher and CSYS levels. It also assesses recent evidence (HMI Audit Unit, 1999) that young people of similar ability who sit five Highers in S5 tend to attain more highly than those who only sit four.

Patterns of presentation by high attainers

High attaining females (ie who left school with 4+ Highers) were more likely to have attained grades 1-3 in all the Standard Grades they sat in S4 than high attaining males (eight out of ten females compared with seven out of ten males). Females also tended to sit more Standard Grades than males, with the overall result that females' S4 attainment was higher than males by almost half a Standard Grade at grades 1-3 (average no. of Standard Grades at 1-3: males 7.5, females 7.9).

The pattern was different in S5. On average, high attaining males had sat one-tenth of a Higher more than females in S5, but males and females were equally likely to have passed the Highers they sat. The net result was that males had passed slightly more Highers than females in S5 (males: 3.7, females: 3.6).

A multiple regression analysis was used to explore the number of Highers presented in S5; the results are shown in Table 2.1. The analysis refers only to those who were classified as high attainers on leaving school. As one would expect, the findings in Table 2.1 show that the number of Highers presented in S5 was related to number of Standard Grade awards at 1-3. In addition, high attaining students were likely to have presented more Highers in S5 if they attended an independent school rather than a local authority school, and if their father was in a non-manual occupation. The results in Table 2.1 further confirm that after controlling for Standard Grade awards high attaining females had attempted slightly fewer Highers in S5 than males.

Table 2.1: Multiple regression analysis, dependent variable: No of Highers presented in S5 (High attaining stayers only, N = 948)

	Coefficient (β)
No. of Standard Grade awards at 1-3 in S4	0.12
Type of school (1=independent, 0=local authority)	0.42
Father in non-manual occupation (1=yes, 0=no)	0.19
Gender (1=female, 0=male)	-0.14
Female * No. S Grade awards at 1-3 in S4	not significant
Constant	3.15

In S6 there were no significant gender differences in Highers presented and passed and both male and female high attainers left school with an average of just over five Highers. There were however, gender differences in presentation for CSYS, with high attaining males presenting and passing more CSYS on average than females.

The effect of number of Highers presented in S5

The HMI Audit Unit (1999) recently reported that for a given level of Standard Grade attainment, young people who took five Highers in S5 attained more highly at that stage than those who sat only four Higher Grades. Since this issue affects high attainers, it was investigated further using the SSLS. Of particular interest was whether males and females were affected differently, and the effects of social class and type of school.

Table 2.2: Multiple regression analysis, dependent variable: No of Highers attained in S5 (Those who stayed on beyond S4 only, N=2285)

	Coefficient (β)
No. of Highers presented S5	0.77
No. of Standard Grade awards at 1-3	0.04
Type of school (1=independent, 0=local authority)	0.38
Father in non-manual occupation (1=yes, 0=no)	0.17
Gender (1=female, 0=male)	Not significant
Female * No. Highers presented S5	Not significant
Constant	-0.62

A multiple regression analysis confirmed that if social class, type of school and Standard Grade attainment in S4 were held constant, each additional Higher sat in S5 was likely to result in the attainment of three-quarters of a Higher Grade pass on average. This was equally true of males and females (see Table 2.2 for the regression coefficients). The table shows that, while number of Highers presented in S5 is the strongest predictor of S5 attainment, attending an independent school and having a father in a non-manual occupation both had additional positive influences on S5 attainment, even when attainment in S4 was held constant.

Summary and Discussion

Although there were more female than male high attainers from 1990 onwards, their overall qualifications were broadly similar in 1994. They had the same number of Highers passes on average and the same average grade. Male and female high attainers were equally likely to have CSYS passes, although boys tended to have a higher number on average, because they gained more passes in mathematics (which has a number of papers), and girls were more likely to have completed SCOTVEC modules.

From the findings reported in this chapter, it appears that high attaining females had performed better in S4 than their male counterparts, while their performance by the end of S6 was broadly similar. This implies either that females' performance decelerated or that males 'pulled up' their performance in the upper secondary stages. However, these findings are based on retrospective data, ie the S4 attainment of those designated as high attainers in the upper secondary stages was examined, and we cannot therefore draw firm conclusions about this issue based on this analysis. In chapter 4, S4 attainment as a *predictor* of later high attainment is examined, which allows an assessment of whether males and females progress at different rates through school.

The male high attainers were slightly more likely to attempt Highers in S5 than females with equivalent Standard Grade attainment. One possible interpretation of this is that female high attainers were less willing to take risks than their male counterparts in S5, which would accord with the research reported by Arnot *et al.* (1999). However, it could also be because males and females tended to opt for different subjects in S5, requiring different patterns of presentation.

For a given level of S4 attainment, those who sat five Highers in S5 attained more highly at that stage than those who sat four. We were able to extend this finding, from the HMI Audit Unit (1999), using the SSLS, to show that this was equally true of males and females.

The strong relationship between advantage and attainment has been well-documented (eg Paterson, 1991; Burnhill, Garner and McPherson, 1990) and this was demonstrated again here. Those with fathers in non-manual occupations and those who attended independent schools attained more highly in S5 than others with similar S4 qualifications. The relationship between social advantage and high attainment is explored further in chapter 4.

Chapter 3

Subject choice

This section examines the subject choices of high attaining females and males. It addresses the following questions.

Are there gender differences in subject choices made by high attainers? How do the choices of high attainers compare with those of others? What effect does social class background have on the subject choices of high attainers?

The section focuses in particular on S5 and S6 since pupils have a greater degree of choice during these stages. The discussion is contextualised by an initial brief overview of gender and subject choice more generally.

Overview

The Scottish Curriculum Framework was introduced in 1983 with the intention that all pupils would have equal access to all areas of the curriculum. The curriculum was divided into 8 modes and all pupils were expected to study at least one subject from the core of each mode (see Table 3.1). It was initially intended for those in S3 and S4 and was subsequently applied to later years. It was designed to be implemented gradually and research showed that there were still class and gender differences in subject choice by 1990 (Croxford, 1996). Working class pupils and boys were less likely to take foreign languages, middle class pupils and girls were less likely to study technological subjects and, although almost all pupils were taking science subjects by that time, boys preferred physics, while girls favoured biology.

Table 3.1: Modes and core subjects 1989 and 1999

	1989	Changes by 1999
Language and communication	English	All pupils to study at least one other language
	Other language (not core element)	
Mathematical subjects and applications	Mathematics	
Scientific subjects and applications	Biology	
	Chemistry	
	Physics	
	Science	
Social and environmental subjects	Classical studies	+ Social and vocational skills
	Contemporary social studies	
	Economics	
	Geography	
	History	
	Modern studies	
Religious and moral education	Religious studies	Religious studies only
	Religious and moral education	
Physical education	Physical education	
Creative and aesthetic subjects	Art and design	
	Drama	
	Music	
Technological subjects and applications	Computing studies	+ Graphic communication
	Craft and design	
	Home economics	
	Office and information studies	
	Technological studies	

Scottish Consultative Council on the Curriculum (1989 and 1999)

By 1996, data on Standard Grade attainment at grades 1-7 suggest that almost all pupils were studying English, mathematics, science subjects, social subjects and at least one foreign language in S4 (Table 3.2). More females than males took Standard Grades in creative subjects in that year and relatively equal proportions took technological subjects.

Table 3.2: Standard grade attainment in S4 (1996) subject areas by sex

	% with 1+ Standard Grades at 1-7*	
	Males	**Females**
English	93	95
Other language	80	89
Mathematical studies and applications	95	97
Scientific subjects and applications	93	94
Social and environmental subjects	89	93
Religious and moral education	1	2
Physical education	35	15
Creative and aesthetic subjects	37	53
Technological subjects and applications	77	76

* Source: SSLS 1996C dataset

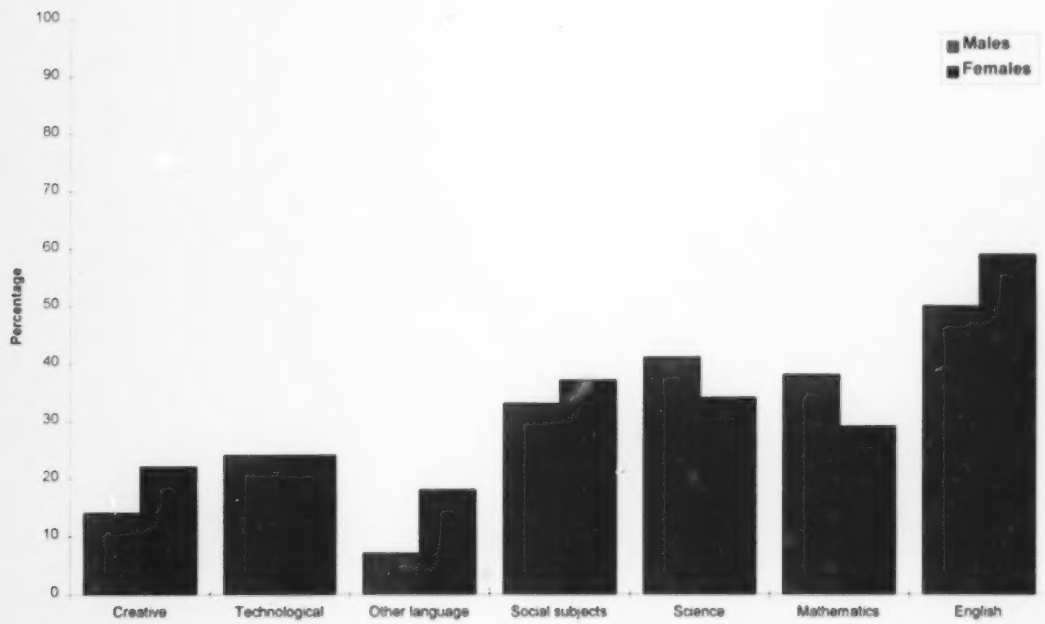


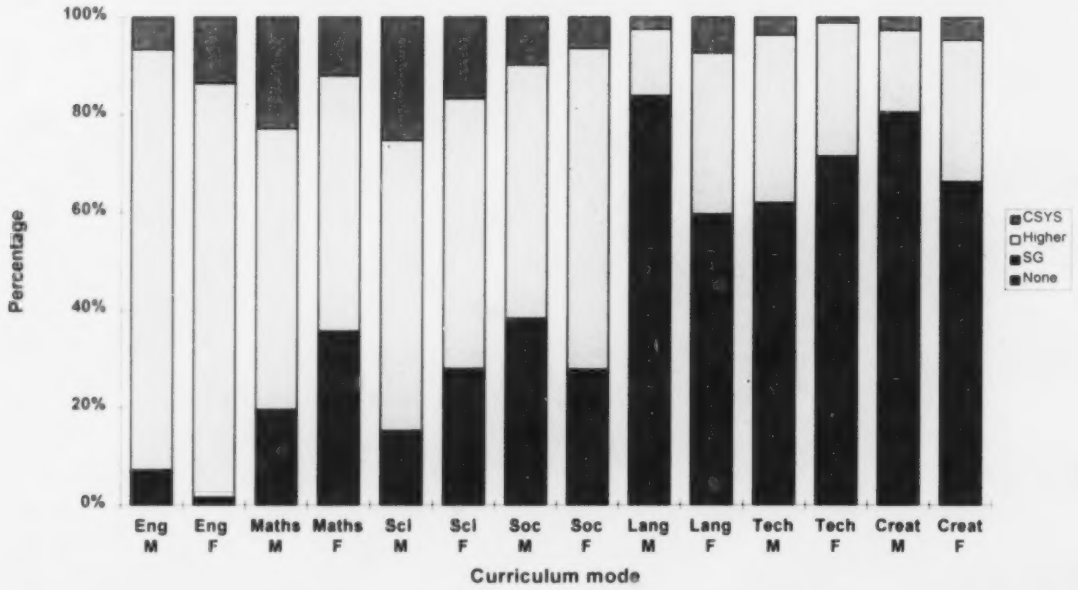
Figure 3.1: Percentage of males and females who gained Higher Grade/CSYS passes in different subject areas in 1994 (Males, N=1024, Females, N=1261)

In S5 and S6, pupils have a greater degree of choice, and the gender differentiation in subjects taken is more noticeable. Figure 3.1 displays the proportions of those who stayed on after S4 who passed Highers at A-C or CSYS at A-E in different subject areas in 1994. Females gained more Highers/CSYS passes in English, foreign languages and creative subjects, while males gained more in science subjects and mathematics. It was only in technological subjects

and social subjects where there were no significant gender differences. The chart only shows SCE qualifications, however, and some young people may have gained SCOTVEC modules, especially in the more vocationally oriented subjects.

The curriculum choices of high attaining males and females

We have seen that, at Standard Grade, gender differences are tempered to some extent by the constraints of the Curriculum Framework, but that they emerge in S5 and S6 when pupils have a greater level of choice. Comparing the highest level qualification gained in different modes by high attaining males and females (see Figure 3.2), we can see that there are significant gender differences in every mode. Females attained more highly in English, other languages and creative subjects, and males in mathematics, science and technological subjects. In social subjects more females overall gained Highers, but more males gained CSYS passes.



Note: PE and RE are not included because the numbers gaining qualifications were relatively small

Figure 3.2: Highest level qualification by curriculum mode by sex of high attaining school leavers 1994

In order to assess whether the curriculum choices of high attaining females are different to those of other females, Figure 3.3 displays the highest level qualifications gained in different modes by those not classified as high attainers. Of course a direct comparison is not feasible, given that, by definition, high attainers will have better qualifications overall. However, comparing the general pattern of qualification in each mode, we can see that, as with high attainers, females tended to have better qualifications in English, languages and creative subjects, while males had better qualifications in mathematics. Unlike high attainers, non high attaining males and females tended to have equivalent qualifications in science, undoubtedly due to the influence of the Curriculum Framework at Standard Grade, and females predominated in technological and social subjects.

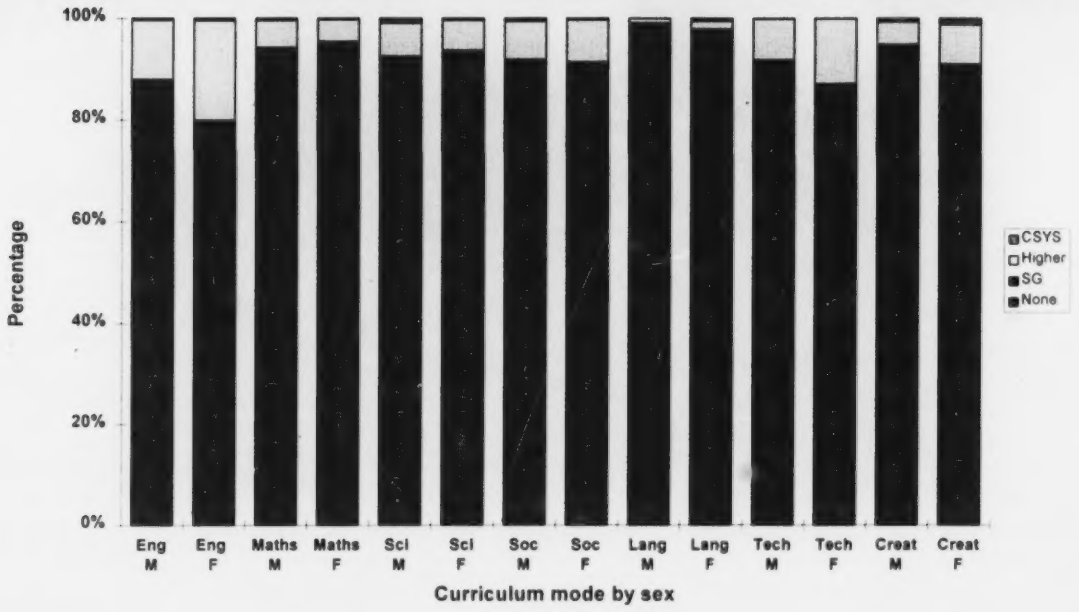


Figure 3.3: Highest level qualification attained in curriculum modes: non high attainers 1994

Gender differences within modes

Croxford (1996) 'emonstrated that there were gender differences in subjects studied within some modes at Standard Grade, particularly within science. Examining the Highers passes of high attaining males and females within science, technological studies and social and environmental subjects (see Table 3.3), we can see that indeed there are gender differences within science and technology, but that there is more of a gender balance within the social and environmental subjects mode. Within the science mode, high attaining females preferred biology, while high attaining males favoured physics and chemistry. Males outnumbered females in all the subjects within the technological mode, and within the social and environmental mode the only gender difference was in history, where females outnumbered males. Data were not available on subjects studied for SCOTVEC modules and this is not a complete picture of gender differences in subject choice. In particular, some subjects in the technological mode will have been studied as vocational qualifications.

Table 3.3: Percentage of high attainers gaining 1+ at A-C in individual subjects

		Males		Females
Science subjects	Biology	28	<	51
	Chemistry	52	>	39
	Physics	68	>	28
Technological subjects**	Computing studies	20	>	6
	Craft and design	4	>	1
	Technological studies	10	>	1
Social and environmental subjects	Economics	12		9
	Geography	32		30
	History	23	<	33
	Modern Studies	23		27

< or > indicates a significant difference in the direction shown.

** Very small percentages gained Highers in the other subjects within the technological mode. These are not reported.

Average number of Highers/CSYS passes in each mode

High attaining females tended to gain more Highers passes in languages other than English and high attaining males tended to gain more in science subjects. At CSYS level, high attaining males gained more passes in mathematics. There were no other gender differences in average numbers of Highers or CSYS passes gained in each mode.

Differences by social class background

Croxford (1996) also found class differences in subject choice, with working class pupils more likely to take technological subjects and middle class pupils more likely to take languages other than English. High attainers from working class backgrounds have already transcended the strong relationship between their social class background and attainment and one could hypothesise therefore that they might opt for similar subjects to their middle class peers. However, Table 3.4 shows that there were social class differences in some of the subject choices of high attaining females and males. High attaining females from working class backgrounds were more likely to gain Highers/CSYS passes in social and environmental subjects, technological subjects and religious studies and less likely to gain passes in English and other languages. The only class difference for high attaining males was in mathematics. Female high attainers from independent schools were even more likely to take other languages and even less likely to take technological and creative subjects than their middle class peers at publicly funded schools, reflecting the more academic curriculum at independent schools (not represented in Table 3.4).

Table 3.4: Percentage of high attainers who gained Highers/CSYS passes in different modes by sex and social class (from father's occupation) (leavers from independent leavers not included) (1994)

	Females			Males		
	Manual		Non-manual	Manual		Non-manual
English	97	<	100	89		94
Mathematical studies	60		68	75	<	85
Scientific studies	70		72	82		88
Social and environmental studies	80	>	69	61		61
Other language	25	<	44	11		16
Religious and moral education	8	>	2	3		1
Physical education	1		3	4		3
Creative and aesthetic subjects	34		37	16		19
Technological subjects	34	>	28	47		37

< or > indicates a significant difference in the direction shown.

Summary and Discussion

The introduction of the Curriculum Framework has tempered gender differences in subject choice in S4 to some extent because all pupils are now required to study core subjects in

English, mathematics, science subjects, social subjects and other languages in S4. However, gender differences emerged in S5 and S6 when pupils had greater freedom of choice.

High attainers are no different to other young people in their fairly traditional gender-specific preferences for certain subjects. Females at all attainment levels preferred English, other languages and creative subjects, while boys preferred mathematics.

The Curriculum Framework has undoubtedly had an impact on historic gender differences in the uptake of science, in that male and female school leavers are now equally likely to have gained qualifications in science subjects. However, boys of all attainment levels are more likely to study it at more advanced levels and, within the science mode, there were clear gender differences, with more boys studying physics and chemistry and more girls studying biology.

Within the technological mode, males outnumbered females among high attainers, while females outnumbered males among non-high attainers. This may be explained by the variety of different subjects within the mode. High attaining males were more likely to gain Highers in computing and technological studies, traditionally male subjects. However, the mode also includes home economics and office and information studies, which may be favoured by non-high attaining females. In addition, no information was available about subjects studied for SCOTVEC modules. Some young people will have studied technological subjects for vocational qualifications.

Overall, more females than males gained qualifications in social and environmental subjects, but males, particularly high attainers, were more likely to gain CSYS passes. Within the mode, the only gender difference among high attainers was in history, which was chosen by more females in S5/S6.

Class differences in subject choices were more marked for female high attainers than for males. Middle class girls were even more likely to take English and other languages, while working class girls preferred social and technological subjects.

The research literature offers possible explanations for the reported gender differences in subject choice. The main reason given by young people themselves for choosing subjects to study at 16+ is interest in the subject, followed by relevance to their chosen careers and being good at the subject (Keys *et al.*, 1998). Arnot *et al.* (1999) reported a strong statistical relationship between doing well in a subject and studying it further. Others have suggested that girls and boys favour different learning styles and excel in different types of assessment tasks (Arnot *et al.*, 1999), which may be more or less evident in the teaching of different subjects. All of these factors may be interconnected, for example, young people may be interested in the subjects they are good at and good at subjects which are delivered in ways which they prefer. These explanations, however, suggest innate differences. It could be that young people have a broader interest in a subject, transcending aptitude and style of delivery, which is conditioned by gender attitudes and values within society.

Whatever the explanation, young peoples' subject choices have a significant impact on the opportunities available to them later. This is illustrated in a very real sense by recent research in England which showed that those with A level mathematics (at whatever grade) went on to earn up to 10% more than others with similar characteristics and qualifications. This was true even when particular mathematics-related careers were removed from the equation (TES, 19/2/99 reporting research by the Centre for Economic Performance). Thus while the qualifications of high attaining females may appear similar to those of males in many ways, females' preference for language and creative subjects is likely to lead to lower returns later on in the labour market.

Chapter 4

Factors related to high attainment

This chapter examines factors related to high attainment and assesses whether these are different for boys and girls. A range of factors are considered at the school, family, local area and individual level. The following specific questions are addressed.

What factors are related to high attainment and how do these differ for males and females? Are boys and girls with equivalent Standard Grade qualifications equally likely to go on to become high attainers in S5 and S6? Are girls more likely to stay on at school than boys with equivalent qualifications and how is this related to high attainment? Are students' attitudes to school, truancy and levels of parental support related to high attainment?

Very little research to date has focused specifically on high attainment. The chapter therefore begins with a brief summary of relevant research on factors which have been shown to be related to attainment more generally.

Background

The relationship between social advantage and academic attainment has been well documented. Paterson (1991) and Burnhill, Garner and McPherson (1990) showed that those from advantaged social class backgrounds and those with more educated parents were more likely to do well at school than others. Using more recent data Biggart (1999, in this series), demonstrated that the strongest predictor of *low* attainment was social disadvantage. Sammons (1995) confirmed these findings and, in addition, showed that those from minority ethnic backgrounds tended to do better at school than others.

A range of different factors within schools have been shown to influence gender differences in performance. These include pupil grouping, assessment techniques, curriculum, teaching styles, teacher expectations, role models and the way in which teachers reward and discipline (Arnot *et al.*, 1999; Powney, 1996).

Whitehead (1994), in one of the few studies focusing specifically on academic success, found a relationship between young girls' attitudes and academic attainment. She showed that girls with more traditional gender stereotyped attitudes tended not to do as well at school, regardless of ability levels. Girls who did well had rejected traditional gender roles for themselves and society, tended to see themselves as competent, to have high levels of intrinsic motivation and to have positive attitudes about the value of school work.

Different peer pressures for boys and girls can play an important role in levels of achievement (Arnot *et al.*, 1999). In a study of pre-adolescent children, Adler *et al.* (1992) found that, for boys, athletic ability, 'coolness', defiance of authority, social skills and success with girls provided routes to popularity. Boys who were academically successful were seen as 'nerds' or 'brainy' and could suffer for it among their peer group. Conversely, girls achieved

popularity through academic success, physical appearance, social skills and socio-economic status.

Findings

Using the data available, it was not possible to assess the influence of all of the factors mentioned above. For example, while information is available on social class and parental education, no information is available in the SSLS on minority ethnic background; information is available on type of school, but not on classroom processes. Even with these limitations, however, the SSLS does provide a fairly rich source of data for this particular aspect of the study in that information is available at all levels, including individual, family/home, school and local area. Multilevel modelling is used to assess the influence of these factors on high attainment in relation to each other and to assess the variation between schools in their ability to produce high attainers, when other factors are held constant.

The modelling was carried out in a number of steps to enable us to 'unpack' the components of high attainment. The first step (our core model) examines the influence of school, family, home and local area factors on high attainment at the end of schooling and assesses whether this is different for boys and girls. The second examines S4 attainment as a predictor of high attainment by the time of leaving school for boys and girls. The third looks at the effect of choices to stay on beyond compulsory schooling. The fourth looks at the influence of attitudes, experiences and levels of parental interest on high attainment.

School, family, home and local area factors

As expected, there was a strong relationship between social advantage and high attainment. Table 4.1 shows that social class, levels of parental education, type of school and type of housing were all related to high attainment and that, overall, females were more likely than males in equivalent circumstances to become high attainers. Having a father in a non-manual occupation, attending an independent school, and having more educated and home-owning parents were all positively related to high attainment. Interactions between all of these factors and gender were tried separately in the model and none were significant, which means that the female advantage did not vary by circumstances. For example, while independent school leavers did better than local authority school leavers overall, girls did better than boys at independent schools and at local authority schools. Similarly, among young people from 'non-manual backgrounds' and from 'manual backgrounds' girls did better than boys.

In our model we have focused on factors related to high attainment. Compared with other research, which focused on attainment more generally, our model has identified a more restricted set of significant social-background influences. For example, other analyses of the attainment of young people in Scotland have found significant effects on attainment of family composition (Croxford and Cowie, 1996), local area (Garner and Raudenbush, 1991) and school denomination (McPherson and Willms, 1986). We used our model to test the effect of

family composition in S4 (including number of siblings and number of parents), population density in the local area, and school denomination, but found them not to be significantly related to high attainment when the other measures of social advantage were taken into account. There is considerable overlap between a number of the measures of social advantage; for example, it is interesting to note that while the variable 'living with two adults in S4 (at least one of whom was a natural parent)' was positively related to high attainment, the influence was not significant after type of housing was added to the model. These two variables are related, since lone parents were more likely to live in rented accommodation, and the influence of number of parents is therefore accounted for through the influence of type of housing.

There were significant differences between schools in the probability of high attainment, even when pupils' social circumstances and type of school were taken into account. This is demonstrated by the fact that the between-school variance was significant. However, there was no evidence of difference between schools in the gender gap. Girls tended to do better than boys in all schools (tested by allowing gender to vary at level 2 in the model), when other factors were held constant.

Table 4.1: Multilevel model: the influence of school, family, home and area factors on high attainment (N=3107, dataset 94L)

		Relationship with high attainment	Coefficient (standard error)
Gender	Female	+	0.27 (0.09)
School type	Independent	+	1.04 (0.20)
Father's social class	Non-manual	+	0.85 (0.10)
Mother's education	17+ years	+	0.64 (0.11)
Father's education	17+ years	+	0.50 (0.12)
Housing type	Owned	+	0.94 (0.13)
	Unknown	+	0.65 (0.30)
Between school variation		*significant*	*0.13 (0.06)*

Reference category: male, local authority school, manual, parents educated to 16 years or less or unclassified, rented accommodation

The effect of S4 attainment

Females had higher average Standard Grade attainment than males (Chapter 2). This section focuses on the question: *Are boys and girls with equivalent Standard Grades equally likely to become high attainers?*

In order to answer this question, we took the core model shown in Table 4.1 and included S4 attainment. The results are shown in Table 4.2, and suggest that the answer to our question is broadly 'yes'. Not surprisingly, attainment at Standard Grade is a strong predictor of later attainment and girls and boys with equivalent Standard Grades were equally likely to become high attainers in S5 and S6, although the coefficient for gender is positive, suggesting a slight female advantage, but it is within the range of sampling error (ie not significant). The

interaction terms show some variations in the broad picture: boys with 5 and 7 Standard Grades at 1-3 were more likely than girls to become high attainers. Overall, however, the broad principle holds true.

The relationship between S4 attainment and later attainment is not straightforward. Table 4.2 shows that those in relatively advantaged circumstances were more likely to become high attainers than others with equivalent S4 qualifications. We know from previous research (Paterson, 1991) that relative advantage positively influences attainment in S4. These results show that social class, parental education, type of school (independent or local authority) and type of housing had a further additional influence on attainment at later stages, even when Standard Grade attainment was held constant. There were differences between schools in the probability of high attainment in S5/S6, when Standard Grade attainment and other factors were taken into account. This is evidenced by the significance of the between-school variance in this model.

Table 4.2: Multilevel model: the influence of S4 Standard Grades on high attainment in S5 and S6 (N=3107, dataset 94L)

		Relationship with high attainment	Coefficient (standard error)
Gender	Female	ns	0.57 (0.36)
School type	Independent	+	1.18 (0.23)
Father's social class	Non-manual	+	0.49 (0.11)
Mother's education	17+ years	+	0.42 (0.13)
Father's education	17+ years	+	0.41 (0.14)
Housing type	Owned	+	0.52 (0.15)
	Unknown	ns	0.71 (0.38)
No. Standard Grades at 1-3 in S4	5	+	1.81 (0.42)
	6	+	2.42 (0.35)
	7	+	3.77 (0.32)
	8+	+	4.63 (0.31)
Interactions	Female*5 S Grades	–	-1.35 (0.63)
	Female*6 S Grades	ns	-0.71 (0.48)
	Female*7 S Grades	–	-1.57 (0.43)
	Female*8+S Grades	ns	-0.43 (0.39)
Between school variation		*significant*	*0.22 (0.09)*

Reference category: male, local authority school, manual, parents educated to 16 years or less or unclassified, rented accommodation, fewer than 5 Standard Grades at 1-3 in S4.

Staying on at school beyond S4

This section examines the influence of decisions to stay on at school on high attainment at later stages and assesses how this differs for boys and girls. It first examines whether girls are more likely than boys with equivalent S4 qualifications to stay on at school. It then goes on to assess whether, once they have stayed on, girls are more likely than boys to become high attainers.

Table 4.3: Multilevel model: factors related to staying on beyond S4 (N=3107, dataset 94L)

		Relationship with staying on	Coefficient (standard error)
Gender	Female	+	0.41 (0.15)
School type	Independent	+	2.40 (0.58)
Father's social class	Non-manual	+	0.33 (0.13)
Mother's education	17+ years	+	0.35 (0.16)
Father's education	17+ years	+	0.54 (0.19)
Housing type	Owned	+	0.25 (0.11)
	Unknown	ns	0.11 (0.31)
No. Standard Grades at 1-3 in S4	3	+	1.11 (0.25)
	4	+	1.15 (0.24)
	5	+	1.40 (0.26)
	6	+	2.15 (0.25)
	7	+	3.49 (0.36)
	8+	+	4.26 (0.39)
Interactions	Female*3 S Grades	ns	-0.66 (0.34)
	Female*4 S Grades	ns	0.18 (0.36)
	Female*5 S Grades	ns	0.56 (0.38)
	Female*6 S Grades	ns	-0.21 (0.37)
	Female*7 S Grades	–	-1.36 (0.44)
	Female*8+S Grades	ns	-0.29 (0.51)
Between school variation		*significant*	*0.34 (0.09)*

Reference category: male, local authority school, manual, parents educated to 16 years or less or unclassified, rented accommodation, fewer than 3 Standard Grades at 1-3 in S4.

Generally, girls were more likely than boys with equivalent qualifications to stay on at school beyond S4 (Table 4.3). The only exception were girls with seven Standard Grades at 1-3, who were actually less likely than boys to stay on (see the interaction term in the table). Number of Standard Grades attained at 1-3 in S4 was a strong predictor of staying on at school. However, over and above this, those in more advantaged circumstances were more likely to stay on than others with equivalent qualifications. Thus, having a father in a non-manual occupation, having more educated and home-owning parents and attending an independent school all increased a young person's chances of staying on regardless of their S4 qualifications.

Schools varied in their relative success at retaining their pupils beyond S4, even when pupils' S4 qualifications and social circumstances were held constant (the between-school variance was significant).

Summarising the story so far, girls do better than boys in S4. Girls and boys with equivalent Standard Grades are equally likely to become high attainers later (other things being equal). But girls are more likely than boys with the same qualifications to stay on beyond S4, which is a pre-requisite for high attainment as defined in this study. Table 4.1 showed that girls were more likely than boys to become high attainers in S5 and S6. It could be that this female advantage is entirely explained by their better performance in S4 and their greater likelihood of staying on. The question remaining, therefore, is whether there are any gender differences

in performance once young people have entered S5 and S6. In order to answer this, the next section addresses the specific question: *among those who stayed on, were girls more likely than boys to become high attainers?*

Table 4.4 shows that the answer to this question is 'no': girls and boys who stayed on to S5/S6 were equally likely to become high attainers, other things being equal. The table also confirms the previous findings that while prior attainment is a strong predictor of later attainment, those in socially advantaged circumstances were more likely to become high attainers regardless of prior attainment.

Thus, the fact that there were more female than male high attainers in S5 and S6 is explained by their better performance in S4 and their greater likelihood of staying on, not by any female acceleration or male deceleration in the upper secondary stages. While the female advantage in S5 and S6 is accounted for largely by their better attainment in S4, none of the factors examined so far have offered any explanation for why girls do better than boys at all stages.

Table 4.4: Multilevel model: factors related to high attainment among those who stayed on to S5/S6 (stayers only, N=2232)

		Relationship with high attainment	Coefficient (standard error)
Gender	Female	ns	0.46 (0.37)
School type	Independent	+	0.66 (0.19)
Father's social class	Non-manual	+	0.68 (0.10)
Mother's education	17+ years	+	0.50 (0.11)
Father's education	17+ years	+	0.38 (0.12)
Housing type	Owned	+	0.79 (0.13)
	Unknown	ns	ns
No. Standard Grades at 1-3 in S4	5	+	1.58 (0.43)
	6	+	1.93 (0.36)
	7	+	3.14 (0.33)
	8+	+	3.96 (0.31)
Interactions	Female*5 S Grades	-	-1.54 (0.64)
	Female*6 S Grades	ns	-0.64 (0.49)
	Female*7 S Grades	-	-1.38 (0.44)
	Female*8+S Grades	ns	-0.35 (0.40)
Between school variation		*ns*	*0.16 (0.09)*

Reference category: male, local authority school, manual, parents educated to 16 years or less or unclassified, rented accommodation, fewer than 5 Standard Grades at 1-3 in S4.

Attitudes and experiences of school and parental interest

None of the factors examined so far 'explain' why there were more female than male high attainers at the end of schooling. Factors, such as social advantage, have been identified which are related to high attainment for both sexes, but overall, girls did better than boys regardless of social background. This section examines the influence of attitudes and experiences of school and levels of parental interest, to determine whether these influenced

high attainment differently for males and females. Before going on to describe the relationships with high attainment using a multilevel model we will first describe these variables.

Attitudes towards school

There are a number of variables in the SSLS asking about respondent's attitudes and experiences of school. Factor analysis using a principle components extraction method enabled us to collapse these into six variables to describe young people's attitudes and experiences of school. These are summarised in Table 4.5, and more detailed information is given in Appendix 1. The first variable *Friends* was derived from a question which asked young people whether they agreed or disagreed with the statement 'My friends took school seriously'. This variable may provide an indication of peer-group influences. The variable *Homework* is derived from questions which asked young people whether they agreed with either or both of the statements 'Teachers often gave me homework' and 'Teachers made me do homework they set'; *Homework* therefore has a score of 0, 1 or 2 referring to whether the respondent agreed with none, one or both of the statements respectively. The other four attitudinal variables *Views of school, School conditions, Teachers cared* and *Level of help from teachers* are derived as total scores from a number of different statements which are detailed in Appendix 1.

Table 4.5: Attitude variables

Variable	Meaning	Values
Friends	My friends took school seriously. Agree/disagree	1 = agree
Homework	'Teachers often gave me homework'. 'Teachers made me do homework they set.' Score 0-2	Score of 2 = agreed with both statements
Views of school	eg 'school helped give me confidence to make decisions'. Score 0-5	High score = positive view
Poor school conditions	eg 'There were too many troublemakers in my classes'. Score 0-5	High score = poorer conditions
Teachers cared	eg 'My teachers listened to my ideas and views'. Score 0-4	High score = positive view
Level of help from teachers	eg 'Teachers helped with school work'. Score 0-7	High score = lots of help

Table 4.6 displays the average scores and percentages for these variables for high attainers and others. It shows that females and males had significantly different scores on *Friends* and *Homework*, and this was the case for high attainers as well as those who were not high attainers. Male and female high attainers did not have significantly different scores on the other variables, but non-high attainers did. On the whole high attainers expressed more

positive attitudes towards school and among those who were not high attainers, females were more positive than males.

Table 4.6: Actual scores and percentages for attitudinal variables

		Males	Females
Friends (% agreeing)	*High attainers*	62	71***
	Others	38	49***
Homework (average score)	*High attainers*	1.6	1.7***
	Others	1.3	1.5***
Views of school (average score)	*High attainers*	4.0	3.9
	Others	3.4	3.6***
School conditions (average score)	*High attainers*	1.6	1.6
	Others	2.6	2.3***
Teachers cared (average score)	*High attainers*	3.2	3.2
	Others	2.6	2.9***
Level of help from teachers (average score)	*High attainers*	3.3	3.5
	Others	3.0	3.4***

*** Significantly different at the p<0.001 level.

Truancy

Truancy is an important indicator of students' attitudes to school. It has implications for attainment because truanting reduces students' opportunities to learn. However, the relationship is not clear cut because truancy may in some cases be a response to awareness of low attainment. High attaining pupils were more likely to report that they had never truanted than students who were not high attaining (64 percent vs 36 percent: see Appendix 1). However, there were no gender differences in students' propensity to report that they had never truanted.

Parental support

A number of questions about levels of parental support are included in the SSLS survey. Responses to one of the questions concerning contact between parents and the school are summarised in Table 4.7. High attainers were more likely than other students to report that their parents visited or telephoned the school at least once per year to check on progress. However, there were interesting gender differences: among high attainers more females than males reported that their parents contacted the school to check on progress, whereas among non high attainers more males than females reported this. Responses to the other questions about parental support by female and male high attainers and others are included in Appendix 1.

Table 4.7: Percentage agreeing that their parents had visited the school at least once per year to check on progress by high attainment and gender

	Males	Females
High attainers	71	77*
Non-high attainers	52	47**

* P<0.05; ** P<0.01

The effect on high attainment

In order to examine the relationship between attitudes, experiences, parental interest and high attainment, we included these variables in the core model (shown in Table 4.1). At this stage we did not include S4 attainment because it is a component of overall attainment and does not 'explain' high attainment. The results are given in Table 4.8.

We first included the variables describing attitudes and experiences of school. We found that after controlling for all other factors in the model there was a significant relationship between high attainment and *Friends, Homework* and *Views of School.* This means that high attainers were more likely to agree with the statement 'my friends took school seriously'; more likely to agree that they had been given homework and made to do it and more likely to have expressed positive views of the benefits of school. Some care should be exercised in interpreting these results, since positive attitudes towards school could be as much a consequence of doing well as a cause. There was no evidence that the other attitudinal variables, *School conditions, Teachers cared* and *Level of help from teachers* were related to high attainment. This was at least partly because young people's answers to these items were correlated with their answers to the variables that were significant (ie *Friends, Homework* and *Views of School*) and any effect would therefore have been masked.

It is interesting to note that when *Friends* and *Homework* were added to the model, the gender difference in high attainment disappeared. This is because there were gender differences in high attainers' answers to these questions. We have shown that high attaining females were more likely than high attaining males to agree that their friends had taken school seriously and that they had been given homework and made to do it. The fact that high attaining girls were more likely to agree that their friends had taken school seriously seems to lend weight to the findings of Adler *et al.* (1992) on the different peer cultures experienced by girls and boys. While academic success was valued by girls, doing too well at school could disadvantage boys among their peer group. This suggests that those boys who did do well at school had to transcend their peer culture somehow, either by forgoing popularity among their peers, or by doing well while not being seen to take school too seriously, perhaps by appearing not to put too much effort in. This hypothesis can only be tested by further research.

The gender difference in responses to the *Homework* questions are more difficult to explain. On the one hand it suggests that boys and girls have different perceptions of the same experience, for example that girls were more likely to *perceive* that they were often given homework and made to do it. It could also suggest, however, that girls took homework more seriously than boys or that they paid more attention to it, both of which would accord with the evidence that girls took school more seriously than boys.

Of the variables describing parental support, just one had a significant relationship with high attainment given all the other variables in the model; this was the interaction between frequency of school visits and gender (see Table 4.8). We have seen (Table 4.7) that the parents of high attainers were most likely to make school visits, but that the relationship varied for boys and girls. Among high attainers, females' parents were more likely to visit, while among non-high attainers, boys' parents were most likely to visit. This variable had a significant influence even when level of parental education and social class were held constant. This suggests that when children are not doing so well at school, parents are more concerned about their sons' progress than their daughters'. It also shows that high attainers tended to have parents who were more interested in their progress and that this was even more so for high attaining females.

The final variable to be added to the model was level of truancy. Not surprisingly those who had truanted were less likely to become high attainers (see Table 4.8). There were no gender differences in this effect. As with the attitudinal variables, care should be taken in interpreting this result, since truancy can be just as much a result of failure at school as a cause of it.

Table 4.8: Multilevel model of high attainment including attitudinal and parental variables (N=3107, dataset 94L)

		Relationship with high attainment	Coefficient (standard error)
Gender	Female	ns	-0.18 (0.16)
School type	Independent	+	0.73 (0.20)
Father's social class	Non-manual	+	0.72 (0.10)
Mother's education	17+ years	+	0.57 (0.11)
Father's education	17+ years	+	0.50 (0.12)
Housing type	Owned	+	0.87 (0.13)
	Unknown	ns	0.57 (0.29)
Friends	Agree	+	0.42 (0.10)
Homework	Often given and made to do it	+	0.20 (0.08)
Views of school	Positive	+	0.48 (0.18)
Views squared*		-	-0.07 (0.03)
Parents visited at least once/year	Yes	ns	0.21 (0.14)
Interaction	Female*parental visits	+	0.57 (0.19)
Truancy	Days/weeks at a time	-	-2.03 (0.39)
	Lesson/day at a time	-	-0.64 (0.10)
	No answer	-	-1.26 (0.89)
Between school variation		*significant*	*0.14 (0.06)*

* Included to test whether the relationship between views and high attainment is linear. Its significance indicates a non-linear relationship.

Summary and discussion

A strong relationship was established between social advantage and high attainment. Those with fathers in non-manual occupations, more educated, home-owning parents and those at independent schools had several advantages over their peers. To begin with, they tended to do better in S4. S4 attainment was a strong predictor of later attainment, and one might have expected that those with equivalent Standard Grades would have gone on to do equally well later on. However, those in socially advantaged circumstances were even more likely to stay on at school and to become high attainers in the upper secondary school, than others with equivalent S4 qualifications.

While social advantage was strongly related to high attainment, it did not explain why females were more likely to become high attainers than males, since females from all social backgrounds did better than males in equivalent circumstances.

The female advantage in S5/S6 was partly due to females carrying their better performance in S4 through to later stages and partly to do with the greater likelihood of them staying on beyond S4. Boys and girls were equally likely to convert their S4 Standard Grades into high attainment later, and those who chose to stay on were equally likely to become high attainers which means that the female advantage was being established in S4 and carried on into S5/S6, rather than that the performance of males or females was accelerating or decelerating in the upper secondary school.

The use of multilevel modelling enabled an analysis of between-school variation. This showed that there were significant differences between schools in the probability of their pupils becoming high attainers, in the likelihood that pupils would stay on beyond S4 and the chance that they would convert their S4 attainment into later high attainment. However, there was no evidence of variance between schools in the gender gap in attainment, when other factors were held constant.

There was evidence that high attaining females took school more seriously than high attaining males. This offers a potential explanation for the differential performance of boys and girls. Other research (Adler *et al.*, 1992) has shown that there is an 'achievement ceiling' for boys beyond which they risk becoming unpopular with other boys, while conversely academic success is valued among girls. This may offer some explanation for the relative under-achievement of boys. If this is true boys who do well at school have to transcend the pressures of their peer group culture in order to succeed. Further research is required to test this hypothesis further.

Parental interest was related to high attainment, although somewhat differently for males and females. While the parents of high attainers tended to visit schools more often to discuss progress, the parents of high attaining females seemed to take a particular interest in their daughters' progress. Among non-high attaining pupils, the parents of male children visited more often than those with female children. This suggests that, when children are not doing so well, parents are more concerned about their sons' progress than their daughters'.

Chapter 5

Post-school destinations

This chapter examines the post-school destinations of high attaining females and compares them with those of other young people. It addresses the following questions.

What do high attaining females do after leaving school? How do their chosen destinations compare with those of high attaining males and other females?

Background

The Equal Opportunities Commission (1998) reports that women of working age in Scotland in 1997 were slightly more likely to have higher education qualifications than men (women: 23%, men: 22%), but also more likely to have no qualifications at all (women: 22%, men: 13%). Women and men tended to choose different types of occupation within different industries. Women, for example, were over-represented in retail, leisure, education and health and social work, while men outnumbered women in manufacturing, construction, transport and the wholesale and motor trade industry. In terms of actual occupations, women were as likely as men to be managers in the service industry, but men were more likely to be managers overall. Women were over-represented in occupations such as teaching, secretarial work and sales. On average women's hourly earnings were 80% of men's, and this percentage was even lower for those in non-manual occupations at 69%.

It is difficult to pinpoint the position of high attaining females within this scenario from the data available. However, in this chapter we are able to examine their immediate post-school destinations, including entry rates to higher education, and, using published statistics, are able to make inferences about their subject choices and attainment levels in higher education and their destinations on graduation.

The post-school destinations of high attainers

If we examine the immediate post-school destinations of high attainers, there were apparently no gender differences in 1994. The majority of them went on to further full-time study directly from school and most of the rest went into full-time employment. Figure 5.1 illustrates that this has been the case since the late 1970s. In all years, very few high attainers went into training or were out of work in the year after leaving school. A small number reported doing something else, which included part-time work.

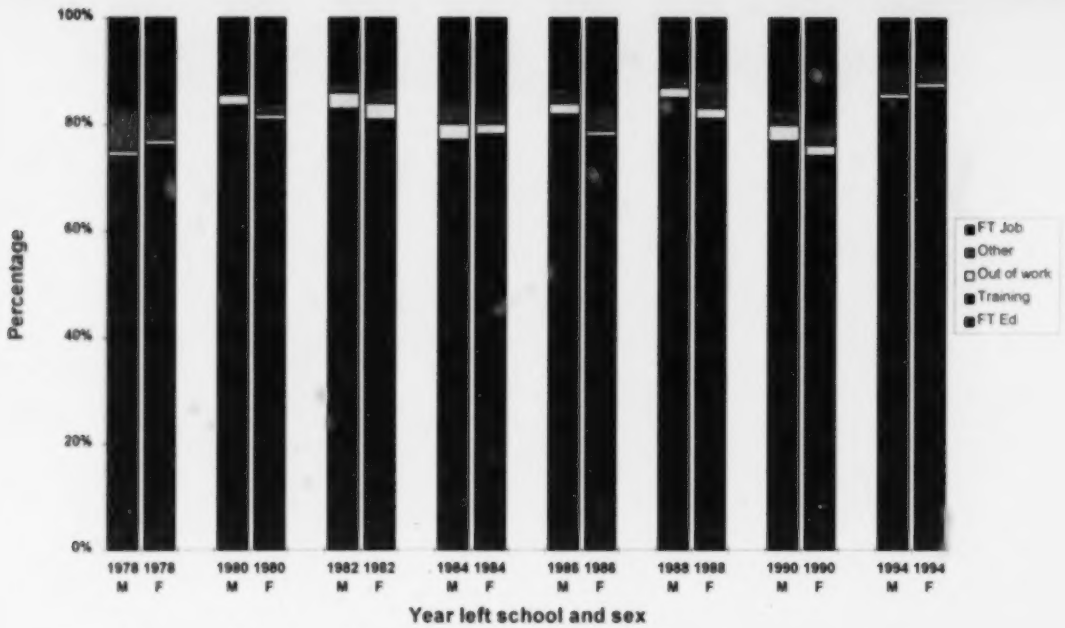


Figure 5.1: Post-school destinations of high attainers 1978-1994

The post-school destinations of those attaining fewer than 4 Highers at A-C were very different to those of high attainers and there were significant gender differences in all years (see Figure 5.2). In the late 1970s the majority of this group went straight into full-time employment. By 1994, this proportion had dropped to about one third. During the period the proportion who entered full-time education increased to one third, with females more likely to choose this option in all years. Entrance to training courses fluctuated during the period, peaking in the late 1980s. Males were more likely to enter training in all years.

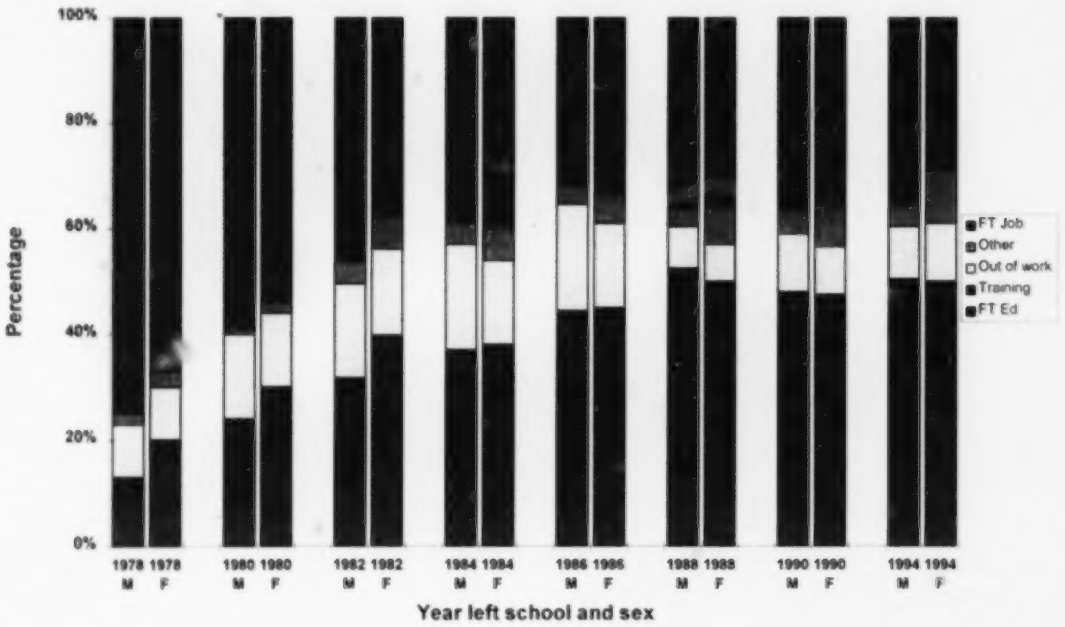


Figure 5.2: Post-school destinations of non-high attainers 1978-1994

Types of study

The majority of male and female high attainers went on to further study after leaving school. This section examines whether they went into the same types of courses. Data from the survey of 1993 leavers is used, as this is the most recently available data which includes information on higher education.

In our report, *Entrants to Higher Education* (Tinklin and Raffe, 1999a) in this series, we reported that, although females were performing better at Highers in 1993, they were less likely than males with equivalent qualifications to go on to higher education after leaving school. This was in spite of the fact that they were equally likely to apply to higher education courses.

Table 5.1 shows that the same is true of high attaining males and females. They were equally likely to apply to higher education courses, with most applying to do degrees. But female high attainers were less likely to start higher education courses than males. In *Entrants to Higher Education*, we reported that this inequality affected degree courses as well as higher education as a whole. However, for high attainers, it only affected degree courses, because relatively few high attainers applied to advanced (other HE) courses as their highest level application. One possible explanation for the difference in entry rates is that females tended to apply to more over-subscribed courses, but we cannot test this using the data available. It is also possible that fewer females than males took up places offered.

Table 5.1: Applications and entry to further study by high attainers 1993*

	Applications		Courses started	
	Male	Female†	Male	Female**
Degree	88	85	83	73
Other HE	6	7	8	8
Non-advanced	2	3	3	6
None	4	6	7	13

* Highest level course applied for.
† Not significantly different.
** Significantly different at p<0.01 level.

Recent official statistics indicate that female participation in higher education among 17-21 year olds has overtaken that of males in the years since 1993 (SOEID, 1998b). However, it is not clear from these statistics whether female entrance rates are now matching their qualification levels.

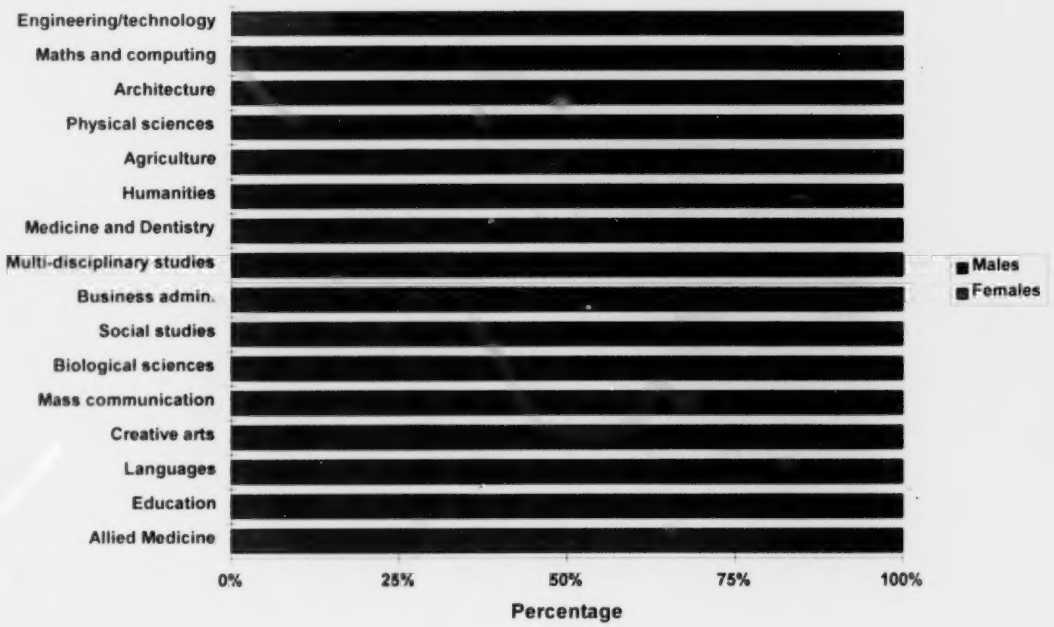
The vast majority of high attainers who started higher education studied full-time courses. This was equally true of males and females.

Subject choice and attainment in higher education

Data were not available in the SSLS on subjects studied by high attainers at degree level. However, we can make some inferences from government statistics on higher education as a

whole, particularly if we look at degree-level study (source Scottish Executive, August 1999). Not all entrants to degrees have 4+ Highers, but they could be described as (potential) high attainers anyway, by virtue of the fact that they have been accepted onto a degree course. If we adopt this new definition of high attainment, we can examine gender differences in subjects studied and attainment at degree level.

Figure 5.3 illustrates clear gender differences in entrance to degree subjects. Engineering and technology, mathematics and computing, architecture and physical sciences were preferred by males, while education, languages, creative arts, mass communication, biological sciences, social studies and business administration were preferred by females. Agriculture, humanities, medicine and dentistry and multi-disciplinary studies had an approximate balance of male and female entrants.



Source: Scottish Executive, August 1999

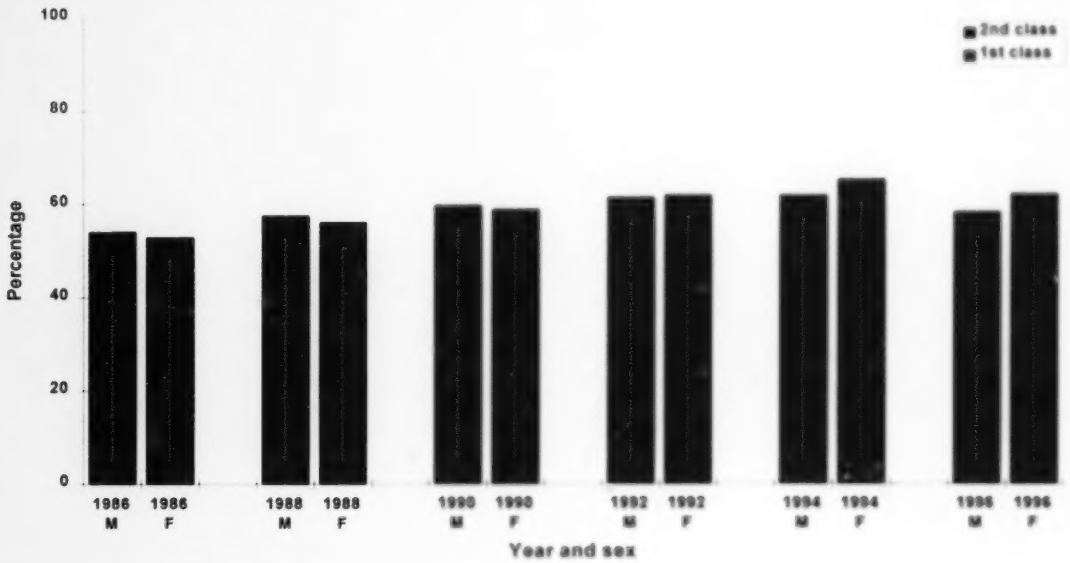
Figure 5.3: Male and female entrants to full-time first degrees by subject 1996-97

Clear gender differences in subject choices at degree level were evident. It should be noted that we are now dealing with students of all ages and as such cannot draw specific conclusions about school leavers. However, since degree-level subject choice is constrained to some extent by prior qualifications, and given the pattern of subjects taken in S5 and S6 by school leavers, it is reasonable to assume that these gender differences were as likely to apply to school leaver entrants as they were to older entrants.

Attainment at degree level

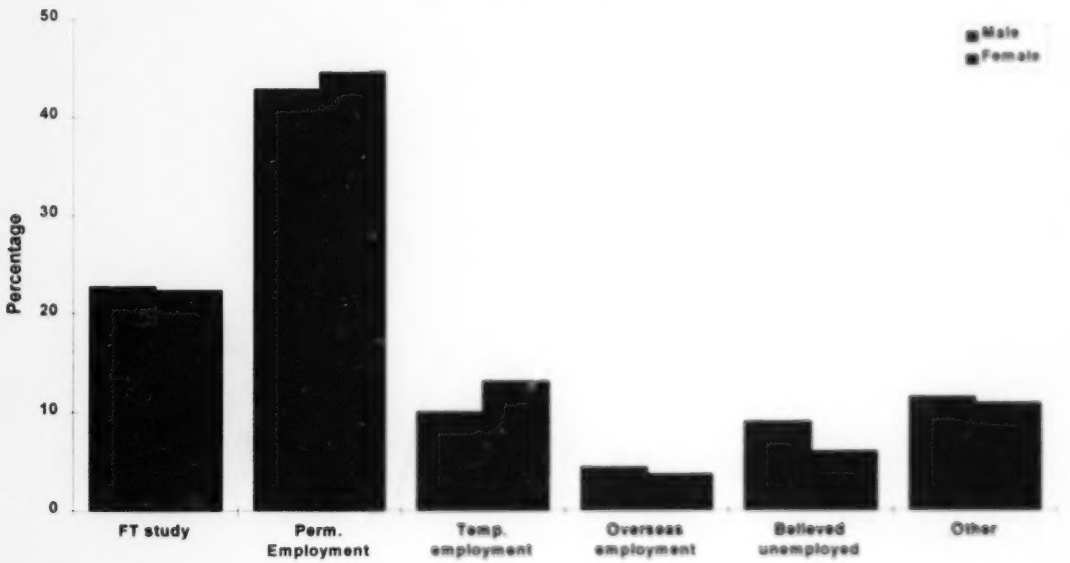
Information on attainment at degree level is not available in SSLS, but using published statistics (SOEID, 1998c), we can examine the attainment of all degree-level students. Figure

5.4 shows that historically females have been less likely to attain first class honours than males, but that the gap was closing in 1996. They were, however, more likely to attain second class honours in most years. This mirrors the findings of McNabb *et al.* (1998) who analysed university student attainment in England and Wales. They showed that although women performed better on average, they were less likely than males with similar characteristics to attain first class honours. This was due partly to women under-performing at the top end of the scale, but also to their over-representation in subjects in which fewer good degrees were awarded. This provides another example of how gender differences in subject choice can have an impact on later 'success'.



* Source: SOEID (1998c)

Figure 5.4: Performance of first-degree graduates by sex and year *



* Source SOEID (1998c)

Figure 5.5: First destinations of degree graduates 1996*

Destinations of first degree graduates

Again, extrapolating from higher education statistics, we can draw some conclusions about the destinations of high attaining females on graduation. Figure 5.5 shows that, in 1996, female degree graduates were less likely to be unemployed, but more likely to have taken up temporary employment than their male counterparts. This mirrors the position of women more generally in the labour market: they have responded to the need for a flexible workforce more than men and are less likely to be unemployed (EOC, 1997).

Summary and discussion

On the surface, the immediate post-school destinations of high attaining females and males are the same, with most of them going on to further full-time education. However, there is evidence to suggest that the different subject preferences of males and females could be disadvantaging women. Women are less likely to start degrees than males with equivalent qualifications, in spite of the fact that they are equally likely to apply. One possible explanation for this is that women may be applying to the more over-subscribed courses. The validity of this can only be established through further research, however, and an alternative explanation is that females are less likely to take up places offered. Furthermore, women's attainment at degree level is affected by their choice of course. On the basis of evidence from England and Wales, female students are over-represented in subjects in which fewer first class degrees are awarded.

We were unable to say anything about the occupational choices of high attaining females post-graduation, from the data available. However, their initial patterns of work mirror those in the population as a whole, with women less likely to be unemployed but more likely to be employed on temporary contracts.

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Chapter 6

Discussion and Conclusions

This report has investigated the qualifications, characteristics and choices of high attaining females, comparing them with other females and with high attaining males as appropriate. This final chapter pulls together the findings of the study and identifies the overarching issues that have emerged.

The impact of subject choice

On the surface the qualifications and first destinations of high attaining female and male school leavers appeared very similar. They left school with broadly similar average qualifications and most of them went on to further full-time study. However, that is as far as the similarity goes. Males and females of all attainment levels tended to choose different subjects in S5 and S6 and this had an important impact on their later attainment and opportunities.

While potential gender differences in subject choice were tempered in S4 by the constraints of the Curriculum Framework, they emerged in S5 and S6 when pupils had a greater degree of choice. They were even more marked in choice of degree subject, with males opting for more stereotypically 'male' subjects such as engineering and technology, mathematics and computing and females choosing more people-oriented subjects such as education, languages and biological sciences.

There was evidence to suggest that gender differences in subject choice at school have an important impact on later attainment and opportunities. High attaining females were less likely to start degree courses, even though they were equally likely to apply. This could have been because they were more likely to apply to over-subscribed courses. This can only be ascertained through further research. There was evidence to suggest that females were less likely to gain first class honours because they were over-represented on courses where fewer firsts were awarded (McNabb *et al.*, 1998). Furthermore, subject choices have an influence on the range of job opportunities available later and go some way to explaining the female: male wage differential.

One way to address gender differences in subject choice in S5 and S6 would be to reduce the level of choice available to young people during those stages. However, the experience of the Curriculum Framework suggests that gender differences in subject choice might then simply emerge later at the point of entry to higher education, or at other points where choice was available. For example, all pupils might take a science subject, but girls might opt for biology, while boys opted for physics.

The fact that gender differences in subject choice appear in the upper secondary stages after all pupils have been required to take the same range of subjects in S4, suggests that young people are still being influenced by wider views in society that some subjects and occupations

are more appropriate for females and some more appropriate for males. Some measures have been taken to address this. For example, the WISE (women into science and engineering) initiative and initiatives in some schools that provide pupils with role models (either teachers or outsiders) of women or men in non-traditional careers or subject areas. However, there is clearly still some way to go before attitudes have really changed.

The findings also suggest that the provision of support and information to pupils throughout their school careers on the potential impact of their subject choices on later opportunities and earnings potential could be useful. However, research has shown that the most popular reason given by pupils for their subject choices was interest in the subject. Earnings potential was not high up the list for most young people, although relevance to a chosen career did come second (Keys *et al.*, 1998). This suggests that those who have chosen to stay on at school at age 16 are prioritising interest and satisfaction over longer-term financial gain at this stage.

Progression through school

We found no statistically significant difference in the probability of girls and boys with equivalent Standard Grades going on to become high attainers later. Since girls did better than boys in S4, this explains to some extent why there were more female than male high attainers in S5 and S6. Girls had an additional advantage, however, in that they were more likely to stay on at school beyond S4 than boys with the same qualifications. Once in the upper secondary stages, females and males with the equivalent Standard Grade qualifications achieved the same attainment at Higher Grade. There was no evidence of a female deceleration or a male acceleration.

The issue is therefore different for females and males. For boys the emphasis needs to be on finding ways to raise their S4 attainment and thereafter encouraging them to stay on at school. While for girls the focus needs to be on their post-16 choices and on raising their awareness of the implications of their subject choices.

There were slight differences between high attaining females and males in their presentations for post-compulsory courses. High attaining females had presented slightly fewer Highers in S5 than their male counterparts, and were more likely to have taken their Highers in S6. In addition, while males presented for more CSYS courses, females presented for more SCOTVEC modules. These different patterns of presentation by females and males may reflect the reported tendency for females to be more cautious in presentations. However, it may also be a reflection of the different subject courses chosen by females and males, and different presentation practice within subject areas. The HMI Audit Unit's (1999) finding that patterns of presentation in S5 affected S5 Higher Grade attainment applied equally to males and females.

Social advantage and high attainment

While the previous findings chart male and female progress through school and explain why there were more female than male high attainers in S5 and S6, they do not illuminate the causes of the female advantage in attainment in S4. Chapter 4 explored factors that were related to high attainment, seeking some explanation for this phenomenon.

A strong relationship between social advantage and high attainment was established. Those with fathers in non-manual occupations, who had more educated and home-owning parents and who attended independent schools enjoyed distinct advantages at several stages of their school careers. First of all they tended to do better than others in S4. Given the strong relationship between S4 attainment and later high attainment, this already increased their chances of becoming high attainers. However, they were then even more likely to stay on at school and more likely to become high attainers than their peers with equivalent qualifications. There are various possible explanations for this, including that more educated parents are probably more likely to instil in their children the value of academic qualifications, to have higher expectations, to be more supportive of their children's studies and to provide role models in their own professional spheres. Indeed, there was evidence that parental interest was important in young people attaining highly at school, regardless of the social class or levels of education of parents.

The relationship between social advantage and attainment has been well-documented and has persisted over time. Of most concern is the evidence of a 'snowball' effect of disadvantage. Differences in attainment by social background emerge as early as Primary 1 (Croxford, 1999). By S4, children from less advantaged backgrounds are doing significantly less well than their peers. They are then less likely to stay on at school, less likely to convert their Standard Grades into Highers, less likely to apply to higher education and once they have applied, less likely to start courses than others with equivalent qualifications (Tinklin and Raffe, 1999a). The Early Intervention Programme is trying to address these inequalities in the early years. But clearly the attention of policy-makers and schools needs to be focused on reducing inequality at all stages of the educational process. The findings of this research also highlight a particular need to raise the aspirations of those with good Standard Grades, who clearly have the potential for later high attainment and higher education, but who do not achieve that.

While social advantage is strongly linked to high attainment, it does not shed any light on the female advantage in attainment. Working class females did better than their male counterparts, just as middle class girls attained more highly than middle class boys. Females at independent schools and at local authority schools did better than their male peers.

Attitudes towards school

The only factor which goes some way towards 'explaining' male and female differences in attainment, was the evidence that girls took school more seriously than boys. This accorded with other research findings which showed that boys who attain highly can suffer at the hands of their peer group. This peer group pressure may well be creating a ceiling on boys' achievement, and may explain their relative under-performance compared with girls. Further research is needed to establish whether this is indeed the case. A current project at the CES ('Gender and Pupil Performance', due to report at the end of 2000) will focus on this and other factors influencing gender differences in performance.

School differences

The other key finding of the study was that there were significant differences between schools in the probability that their pupils would become high attainers, stay on beyond S4 and convert S4 attainment into later high attainment. This was true when pupils' characteristics and qualifications and type of school were held constant. This suggests that there is scope for improvement in some schools. There was no evidence of variation between schools in the gender gap in attainment, when other factors were held constant. This suggests that the factors affecting gender differences in attainment are found equally in all schools.

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Appendix 1: Attitudes and experiences of school and parental interest, responses to questions by high attainers, non high attainers by sex (%)

	High attainers		Non-high attainers		*All*
	Female	**Male**	**Female**	**Male**	
N (=100%)	619	562	1615	1773	4569
PARENTS					
How often did your parent(s) visit or phone your school to discuss your progress?					
Never	4	5	12	10	9
Rarely	8	11	17	18	15
Only over special issues (eg subject choice)	11	13	25	19	19
At least once a year	77	71	47	52	56
					4583
When you were at secondary school how often did your parent(s)...					
...check if you had done your homework?					
Never	22	25	22	18	21
Sometimes	51	50	51	51	51
Often	27	25	27	30	28
....make you do chores around the home?					
Never	7	11	11	16	12
Sometimes	53	56	45	51	50
Often	40	33	44	34	38
...limit the time you spent watching TV?	55	56	67	65	63
Never	37	37	28	28	30
Sometimes	8	7	5	7	7
Often					
...limit your time for going out on school nights?	20	29	25	33	28
Never	45	47	40	42	42
Sometimes	35	24	35	25	30
Often					
...discuss the days events at school with you?	6	12	20	16	16
Never	45	51	51	54	51
Sometimes	49	37	29	30	33
Often					
...urge you to earn money (eg a paper round)?	36	37	30	29	31
Never	38	39	35	33	35
Sometimes	27	24	35	39	34
Often					
...encourage you in your own plans and hopes?					
Never	3	6	8	8	7
Sometimes	24	33	32	35	32
Often	73	61	61	58	61
...urge you to do your best at school?					
Never	2	2	3	3	3
Sometimes	10	12	19	17	16
Often	88	86	78	80	81
...discuss your school reports with you?					
Never	4	3	8	6	6
Sometimes	22	25	30	28	28
Often	75	72	63	66	67

	High attainers		Non-high attainers		*All*
	Female	**Male**	**Female**	**male**	
TRUANCY					
Did you play truant in 4th year at school?					
Never	64	64	36	36	43
A lesson here and there	25	24	29	28	27
A day here and there	11	12	24	27	22
Several days at a time	1	1	7	5	5
Weeks at a time	0	0	4	5	4
Note: for the following items the possible responses were "Agree", "Disagree". Percentages refer to the response shown in brackets.					
FRIENDS					
My friends took school seriously (AGREE)	72	62	50	39	50
HOMEWORK					
Teachers often gave me homework (AGREE)	90	89	80	74	80
Teachers made sure I did homework they set (AGREE)	78	71	66	58	65
VIEWS OF SCHOOL					
School work was worth doing (AGREE)	92	90	84	77	83
School has helped to give me confidence to make decisions (AGREE)	74	73	63	60	65
School has been a waste of time (DISAGREE)	99	99	90	86	91
School has done very little to prepare me for life when I leave school (DISAGREE)	66	71	57	54	59
School has taught me things which would be useful in a job (AGREE)	62	69	67	63	65

	High attainers		Non-high attainers		*All*
	Female	**Male**	**Female**	**Male**	
SCHOOL CONDITIONS					
There were too many troublemakers in my classes (AGREE)	35	37	49	51	46
There was vandalism at my school during the school day (AGREE)	48	50	62	65	60
Theft among pupils was common at my school (AGREE)	19	16	29	34	28
Pupils respected the teachers (DISAGREE)	45	42	65	68	61
Teachers could not keep order in class (AGREE)	17	21	35	42	33
TEACHERS CARED					
If I had a problem there was always a teacher I could talk to (AGREE)	74	71	64	58	64
My teachers didn't care about me (DISAGREE)	95	92	85	77	84
My teachers helped me to do my best (AGREE)	81	81	74	68	73
Teachers listened to my ideas and views (AGREE)	73	75	69	60	67
LEVEL OF HELP FROM TEACHERS					
Note: possible answers to the following were "Yes", "No", "I didn't want help". Percentages refer to "Yes".					
Did your secondary school teachers give you enough help with...					
...choosing subjects at the end of second year?	59	56	58	54	57
...your school work?	86	83	76	71	77
...learning about jobs and careers?	49	50	59	56	55
...your own personal problems?	26	20	28	16	22
...choosing to stay on or leave after S4?	52	44	48	40	45
...choosing a job or career?	35	32	38	32	35
...choosing a course or training after school?	44	43	39	32	38

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